Rainfall-triggered Landslides Bury Sri Lankan Villages

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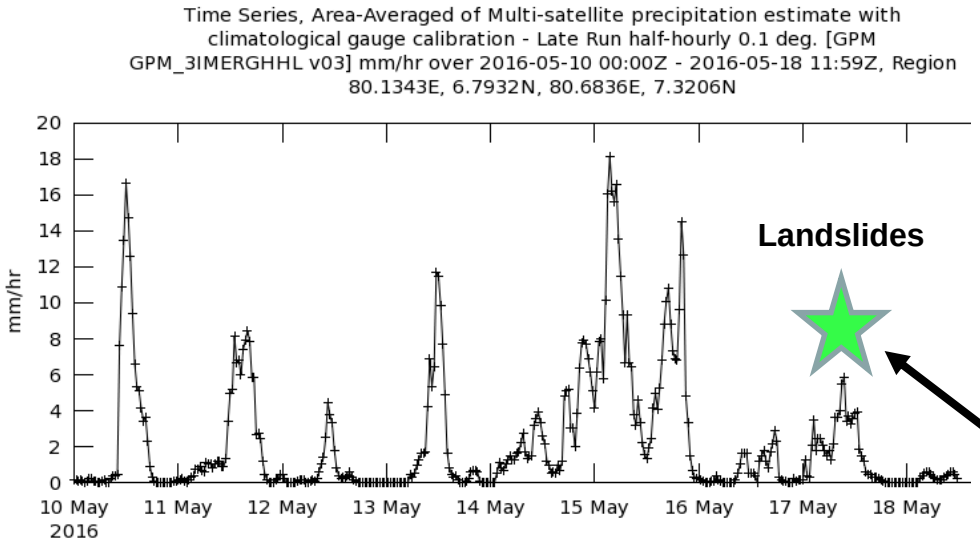

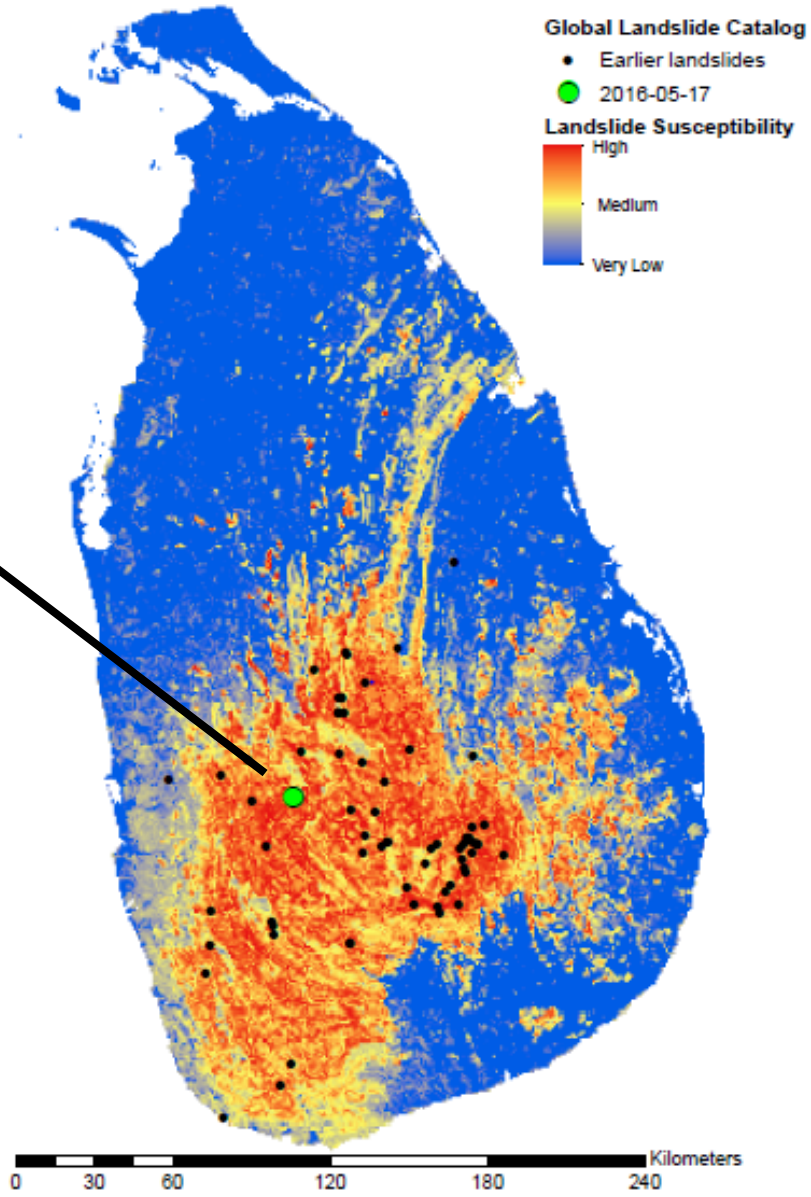

On the afternoon of May 17th, 2016, a major landslide event caused at least 92 deaths, with 109 still missing*. The site was rated highly susceptible to landslides in a new global landslide susceptibility map. GPM precipitation data suggest that both antecedent and current rainfall as well as complex topography played a role in the slope failures.

*BBC News (http://www.bbc.com/news/world-asia-36355980)

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References:

- Time series, IMERG data (pmm.nasa.gov). Visualization of time series: NASA GES DISC Giovanni. J. G. Acker and G. Leptoukh, "Online Analysis Enhances Use of NASA Earth Science Data", *Eos, Transactions American Geophysical Union*, Vol. 88, No. 2 (9 January 2007), pages 14 and 17.
- Map: Stanley, T., and Kirschbaum, D., A heuristic approach to global landslide susceptibility mapping., In preparation for submission to *Natural Hazards*.
- Global Landslide Catalog: Kirschbaum, D., T. Stanley, and Y. Zhou, 2015: Spatial and temporal analysis of a global landslide catalog. Geomorphology, 249, 4–15, doi:10.1016/j.geomorph.2015.03.016. http://linkinghub.elsevier.com/retrieve/pii/S0169555X15001579.
- Background: BBC (2016), Sri Lanka mudslides: Death toll reaches 92 with many still missing, *BBC News*. Available from: http://www.bbc.com/news/world-asia-36355980 (Accessed 23 May 2016)

Data Sources:

- Rainfall: Integrated Multi-satellite Retrievals for GPM (IMERG)
- Elevation: Shuttle Radar Topography Mission, Advanced Spaceborne Thermal Emission and Reflection Radiometer, the Ice, Cloud, and land Elevation Satellite, and the Radarsat Antarctic Mapping Project
- Forest Loss: Landsat
- Geological features: Geological Map of the World
- Roads: OpenStreetMap
- Historical landslides: NASA's Global Landslide Catalog

Technical Description of Figures:

Figure 1: Rainfall rate time series from IMERG data with 0.1-degree spatial resolution and 0.5-hour temporal resolution. Green star indicates approximate time of landslides.

Figure 2: Excerpt from a global map of landslide susceptibility with a 30-arcsecond spatial resolution. Blue indicates areas with very low susceptibility to landslides, typically flat ground. Red indicates the presence of highly susceptible terrain. This map rates landslide susceptibility globally and might not be optimal for any specific region such as Sri Lanka.

Scientific significance, societal relevance, and relationships to future missions:

The global landslide susceptibility map is one component of a prototype landslide nowcasting system developed at GSFC. This system uses rainfall estimates from GPM and other satellites to provide current situational awareness, which enables faster, more informed disaster responses. The susceptibility map may also be used as an aid to prioritizing future research projects such as the remote sensing of landslides by optical or radar instruments.